UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,953	08/21/2003	Takayuki Araki	Q76963	6799

23373 7590 01/26/2006

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
HU, HENRY S	

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/644,953	ARAKI ET AL.	
	Examiner	Art Unit	
	Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Election of November 30, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *3,4,6,8 and 11-25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,7,9 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-25* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3 pages*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. It is noted that Applicants' **Election** filed on November 30, 2005 was received. The Applicants have elected **without traverse on Claims 1, 7 and 9-10 (as generic claims in Group I) along with species Claims 2 and 5 by electing Species (2) for a = 1; $X^1 = X^2 = H$, $X^3 = F$ (Claims 1-2, 5, 7 and 9-10 are thereby elected). Claims 1-25 are now pending** with a total of **thirteen independent claims (Claims, 1-6, 9, 11-15 and 17)**, while Claims 3-4, 6, 8 and 11-25 are withdrawn from consideration. An action follows.

DETAILED ACTION

Specification

2. The disclosure is objected to because of the following informalities:

(a) On **page 36** at line 26, **page 38** at lines 19 and 24, **page 108** at line 10 and may be throughout the specification, all formula should carry "**C=O**" double bond since each one is related to a keto group. Please refer to Claims 11 and 13-14.

(b) On **page 28** at line 22, both formula should carry a skeleton structure of "**-( )-**" since each is related to a structural unit in polymeric chain.

Appropriate corrections for (a) and (b) are required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. *The limitation of parent* ***Claim 1*** *in present invention relates to* ***a fluorine-containing ethylenic monomer having hydroxyl group*** *represented by the formula* ***(1a)****:*

$CX^1X^2=CX^3-(Rf^3)_a-C(Rf^1)(Rf^2)-OH$ *wherein X^1 and X^2 are the same or different and each is H or F; X^3 is H, F, Cl or CF_3* ***(at least one of X^1, X^2 and X^3 is H and X^1, X^2 and X^3 are not H at the same time)****; Rf^1 and Rf^2 are the same or different and each is a perfluoroalkyl group having 1 to 20 carbon atoms; Rf^3 is a fluorine-containing alkylene group having 1 to 40 carbon atoms or a fluorine-containing alkylene group having ether bond which has 1 to 100 carbon atoms and the sum of carbon atom and oxygen atom of two or more;* ***a is 0 or 1****.*

The fluorine-containing monomers described in independent ***Claims 2 and 5*** *relate to the species claims of Claim 1 since it is within elected* ***Species (2) for*** $\underline{a = 1; X^1 = X^2 = H, X^3 = F}$. *See other limitations of dependent* ***Claims 7 and 9-10.***

5. Claims 1-2, 5, 7 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adelman (US 3,444,148) or Inomata et al. (JP 05-238988 A), each individually in view of Araki et al. (US 5,986,150).

Regarding the limitation of three independent **Claims 1, 2 and 5** and with elected **Species (2) for** $\underline{a = 1; X^1 = X^2 = H, X^3 = F}$, two references including **Adelman "148" and Inomata "988"** **each** has individually disclosed the preparation of perfluorinated tertiary alcohol ($-C(CF_3)_2-OH$) containing monomers including (A) $\underline{CH_2=CH-CH_2-}C(CF_3)_2-OH$ (see "148" at column 1, line 40-47; see "988" at column 3, line 9-15), and (B) $\underline{CH_2=CH-(CH_2)_n-}C(CF_3)_2-OH$ (see "988" at column 1, line 10-15). It is noted that both types of the above-mentioned monomers carry a protonated or fluorinated monomeric moiety to be coupled with a perfluorinated tertiary alcohol group ($-C(CF_3)_2-OH$).

6. In a close examination, each of the two references is silent about using the claimed monomeric moiety $\underline{CH_2=CF-Rf-}$ **in view of the elected Species (2) for a = 1;** $X^1 = X^2 = H, X^3 = F$. **Araki** et al. "150" teach that in the course of making fluorinated monomers carry the same perfluorinated tertiary alcohol group ($-C(CF_3)_2-OH$), monomeric moieties such as

CH_2=CH-Y- and CH_2=CF-Y- are functionally equivalent and inter-exchangeable each other; while its linking group Y is starting with a carbon atom and it can be either fluorinated or non-fluorinated (see column 7, line 36-49; column 6, line 20-32; column 13, line 30 – column 15, line 55; particularly see R in vinyl can be H or F, and Y can be alkyl, fluorinated alkyl or its alkoxy analogue group). Bo doing so, functional copolymers with both types of monomeric moieties are particularly useful for excellent affinity with other heat-resisting thermoplastic resins (column 1, line 15-30).

With respect to **ether linked Rf group required in independent Claim 5,** Araki has also taught using such ether linked Rf in various monomers disclosed at column 13, line 30 – column 15, line 55. It is commonly known that such a flexible but inert ether Rf group would increase solubility and thereby with better processability.

7. In light of the fact that all the involving references are preparing similar **functional** fluoropolymer having the same type hydroxyl group, one having ordinary skill in the art would therefore have found it obvious to **synthetically** modify moieties such as **CH_2=CH-CH_2- and CH_2=CH-$(CH_2)_n$- in monomers** from Adelman "148" and Inomata "988" by replacing it with a moiety of **CH_2=CF-Rf-** as taught by Araki. By this modification, one would still expect to succeed based on functional equivalence and interchangeability. Additionally, such obtained functional copolymers may be useful in obtaining excellent affinity with other heat-resisting thermoplastic resins.

8. Regarding **Claims 7 and 9-10**, perfluorinated tertiary alcohol (-$C(CF_3)_2$-OH) containing monomers can be **co-polymerized** with the claimed "**A**" co-monomer(s) in the claimed amount (for examples see **CH_2=C(X)(Y)** in "148" at column 1, line 50-59; see "150" at column 6, line 35-64).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a fluorine-containing ethylenic monomer having a perfluorinated tertiary alcohol (-$C(CF_3)_2$-OH) represented the formula of **CH_2=CF-Rf^3-C(Rf^1)(Rf^2)-OH**, which is within elected **Species (2) for a = 1; $X^1 = X^2$ = H, X^3 = F**:

US Patent No. 3,414,549 to Schaefgen only discloses the preparation of monomer of **CH_2=CH-$C(CF_3)_2$-OH** (column 3, line 24-46; column 8, line 32-39) as well as its linear copolymers. **Such a monomer is clearly within the factors of a = 0, and $X^1 = X^2 = X^3$ = H.** Therefore, it is outside the elected Species (2) for a = 1; $X^1 = X^2$ = H, X^3 = F.

JP Patent No. 2002-90996 A to Asahi Glass Assignee only discloses the preparation of perfluorinated monomers such as **CH_2=CH-$(CH_2)_n$-$C(CF_3)_2$-OH** (column 4, line 6) and **CF_2=CF-$(CF_3)_m$- $C(CF_3)_2$-OH** (column 5, line 18) as well as its copolymers. **Such a monomer is only within the factors of a = 1, and either $X^1 = X^2 = X^3$ = H or $X^1 = X^2 = X^3$ = F.** Therefore, they are outside the elected Species (2) for a = 1; $X^1 = X^2$ = H, X^3 = F.

Additionally, it carries a publication date of **March 27, 2002,** which is later than the priority date February 23, 2001 of instant application.

US Patent No. 3,391,119 to Anderson only discloses the preparation of perfluorinated monomers such as **CF_2=CF-(CF_3)$_2$-CO=CF_3** (column 7, line 1-46; column 1, line 25-32) as well as its copolymers. **Such a monomer is only within the factors of a = 1, and $X^1 = X^2 = X^3 = F$ as well as without any perfluorinated tertiary alcohol group (-C(CF_3)$_2$-OH.**

US Patent No. 6,610,456 B2 to Allen et al. only discloses that in the course of making fluorinated copolymers to be useful for lithographic photoresist, monomeric moieties such as **CH_2=CH-Y- and CH_2=CF-Y- are functionally equivalent and inter-exchangeable; while its linking group Y is starting with a carbon atom and it can be either fluorinated or non-fluorinated** (see column 3, line 1-49; particularly see R_1 can be H or F, and R_2 can be alkyl or fluorinated alkyl group). Bo doing so, copolymers with both types of monomeric moieties are particularly useful for 157 nm resists (column 1, line 38-49; column 2, line 24-33). However, it is styrene-type monomer (column 6, line 20-35). Additionally, it carries a US filing date of **February 26, 2001,** which is later than the priority date February 23, 2001 of instant application.

10. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

January 19, 2006

DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700